

# Studies on Pacific Ferns

## Part I. Nomenclature Changes and Distributions of Some Species of *Hymenophyllum*, *Arthropteris*, *Microlepia*, *Oleandra*, and *Adiantum*

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DURING A PERIOD OF STUDY at the Herbarium of the Royal Botanic Gardens at Kew the author spent some time examining collections of ferns from the South Pacific area. It was quickly apparent that in most groups there is some confusion in interpretation of the various species, and the following paper is an attempt to clear up some of these points.

### GENUS *Hymenophyllum*

Differences between the specimens examined and the descriptions appearing in Copeland's revision of the genus were noted in some small species of *Hymenophyllum* (sens. lat.). Consequently a detailed examination of this group was undertaken, with particular reference to those species possessing fronds with serrated margins which Copeland distinguished as *Meringium* and *Hymenophyllum*. The following observations, which are the result of these investigations, amount to a further revision of this group for the South Pacific region, excluding Australia and New Zealand. The present author prefers to retain, in the meantime, the generic name *Hymenophyllum* for all the species concerned, as he is not convinced of the validity of Copeland's distinguishing characters.

### FIJI

*Hymenophyllum affine* Brack.

*Hymenophyllum affine* Brack. Expl. Exped. 16, 265, 1854.

*Trichomanes macgillivrayi* Bak. Ann. Bot. 5, 195, 1891.

The original description of this Fijian species

by Brackenridge states "sori few on upper half of the fronds—two-valved for  $\frac{2}{3}$  of its length, obovate, lips entire,—receptacle short, included," while Baker describes his species as "sori one to a pinna near the base on the upper side—indusilum with a campanulate tube and sub-orbicular entire lips." These two descriptions are not dissimilar, and a comparison of Baker's type material with the illustrations of Brackenridge's specimen tends to support the idea that these two are in fact the same species. Baker's statement that his material was glabrous is not supported by an examination of the type, which has hairs on the stipe, lower rachis, and rhizome similar to those illustrated by Brackenridge. The difference in size between the two forms described is bridged by later collections from Fiji; and Baker's specimen seems to be a large example only.

Specimens examined (all from Fiji): McGillivray unnumbered (Kew, Baker's type); Parks 20040 (Kew, B.M.<sup>2</sup>); A. C. Smith 1368 (Kew); H.M.S. Herald Bot. No. 138 (Kew); H.M.S. Herald Bot. No. 286 (Kew).

*Hymenophyllum pseudotunbridgense* Watts.

*Hymenophyllum pseudotunbridgense* Watts. Proc. Linn. Soc. N.S.W. 39, 766, 1915.

*Hymenophyllum macgillivrayi* (Bak.) Copel. Philipp. J. Sci. 64, 60, 1937.

In his section on *H. macgillivrayi* Copeland quotes Baker's description of *Trichomanes macgillivrayi*, and supplements this with a further description based on a collection by J. Horne 1877–78, illustrating this on plate 38. This illustration perfectly matches further Horne material at Kew which is distinct from Baker's *T. macgillivrayi*. The involucre is longer and

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narrower in the Horne material and the receptacle is markedly extruded. Copeland has thus confused two quite distinct Fijian species under the name *Hymenophyllum macgillivrayi*. A comparison of the Horne material with species from surrounding areas shows that it is almost identical with *H. pseudotunbridgense* from Queensland, and consequently this name should be given to the form illustrated by Copeland as *H. macgillivrayi*.

Specimens examined (all at Kew): Queensland, Bailey unnumbered; Fiji, Horne 983 in part, 1076, and unnumbered; A. C. Smith 5713.

*Hymenophyllum denticulatum* Sw.

*Hymenophyllum denticulatum* Sw. Schrad.  
Journ. 1800/2, 10, 1801.

This species is quite distinct from all other small Fijian members of the genus in the possession of a conspicuous wing along the whole rachis.

#### NEW CALEDONIA

*Hymenophyllum subdimidiatum* Ros.

*Hymenophyllum subdimidiatum* Ros. Meded.  
Rijks-Herb. Leiden no. 11, 1, 1912.

*Hymenophyllum viride* Ros. Copel. Philipp.  
J. Sci. 64, 59, 1937.

In his treatment of this species Copeland quotes Rosenstock's description and mentions the type material as Schlechter 14799, which he states he has not seen, but in the same paper he publishes the new species *H. viride* from material with the same collection number. The plate illustrating this species shows it to be the same as Rosenstock's original description and the same as a cotype (Schlechter 14799) at Kew.

It is doubtful whether or not this species is distinct from *H. pseudotunbridgense*, for, although no markedly extruded receptacles were noted, the involucre shape is the same and the general appearance of the plant is very similar. However, until a greater amount of comparative material is available it is perhaps better to retain the species.

Material examined: Schlechter 14799 (Kew); Balansa 2701 (Kew, B.M.).

*Hymenophyllum dimidiatum* Mett.

*Hymenophyllum dimidiatum* Mett. Kuhn.  
Linn. 35, 393, 1868.

This species is somewhat larger than the preceding one and is distinct in the possession of a serrated involucre. An examination of the type material shows this fern is not glabrous, as appeared in the original description, but has hairs on the stipe and rachis. In fact, no glabrous species was noted among the groups discussed in this paper.

Specimens examined: Deplanche in Herb. Lenormand (Caen); Vieillard 2258 (Kew, B.M.).

*Hymenophyllum piliferum* C. Chr.

*Hymenophyllum piliferum* C. Chr. Vjschr.  
Naturf. Ges. Zürich 70, 221, 1925.

Christensen separated this from *H. dimidiatum* on the basis of the hairs on stipe and rachis but, as noted above, the type material of that species is not glabrous. However, it is felt that it should be retained as a valid species on the grounds of its more open growth form and much smaller size. It is similar to *H. subdimidiatum* in form and size but has the serrated involucre of *H. dimidiatum*. Copeland included specimens assigned to this by Christensen in his examples of *H. dimidiatum* and ignored Christensen's species completely.

Specimens examined: Franc 1450 in Herb. C. Christensen (B.M.); Rosenstock 133 (B.M.).

*Hymenophyllum pumilio* Ros.

*Hymenophyllum pumilio* Ros. Fedde Repert  
9, 72, 1910.

This is a very reduced species somewhat similar to *H. minimum* of New Zealand, but lacking the spines found on the sides of the sorus in that species. It cannot be confused with any other New Caledonian fern.

#### SAMOA

*Hymenophyllum praetervisum* Christ.

*Hymenophyllum praetervisum* Christ. Engl.  
Jahrb. 23, 338, 1896.

This is the only small species in this section

in Samoa and is quite distinct from the Fijian and New Caledonian forms in having the sori free from the pinnae and not in any way immersed.

#### LORD HOWE ISLAND

##### *Hymenophyllum moorei* Bak.

*Hymenophyllum moorei* Bak. Syn. Fil. 464, 1874.

*Hymenophyllum pumilum* C. Moore, Copel. Philipp. J. Sci. 64, 91, 1937 (in part).

Copeland united the Australian *H. pumilum* and the Lord Howe Island *H. moorei*, disregarding the distinctions noted by Baker in the original descriptions. A comparison of both types at Kew shows that the sori in the Australian material are terminal, not immersed at the base, and have valves slightly serrated at the apex, while the Lord Howe Island specimen has lateral sori, immersed at the base, and with conspicuously toothed valves. The distinction in position of the sori is alone sufficient to retain the two as separate species. Copeland's illustration (pl. 45) figures *H. moorei*, not *H. pumilum*.

Specimens examined: C. Moore unnumbered (Kew), Baker's type.

##### *Hymenophyllum bowense* Brownlie n. sp.

Rhizoma longe repens, sparsis et rufis pilis ornatum; stipes filiformis, 2 ad 4 cm. longus, ad basem pilosus; frondes usque ad 5 cm. altae, 2 cm. latae, lineares ovatae, tri-quadri-pinnatifidae; segmentis usque ad 2 cm. longis, angustis linearibus, inconspicue serrulatis; sori in apicibus segmentorum breviorum, non immersi, indusio suborbiculari, labiis integris, receptaculo exserto.

Rhizome creeping, with scattered multicellular rugose hairs which sometimes occur in clusters at the base of the stipes and at branch junctions. Stipe filiform, 2-4 cm. long, with scattered hairs similar to those on the rhizome. Fronds up to 5 cm. long and 2 cm. wide at the widest point, linear-ovate in outline, flabellately 3 or 4 pinnatifid. Divisions narrow, linear, up to 2 cm. long, obscurely serrate. Sori mostly on upper half of frond, terminal on short segments,

not immersed. Involucre suborbicular, cleft more than half way to the base. Lips entire, receptacle extruded.

Lord Howe Island, Mt. Gower, at a high altitude. C. Moore No. 4 (Kew).

This species is related to *H. pseudotunbridgense* Watts, but is distinguished by the relatively wide frond and very long, narrow segments. The segments are narrower and longer than those of *H. subdimidiatum* Ros., to which it also appears to be related.

The remainder of this paper consists of a varied assortment of ferns in which confusion exists either as to specific distinctiveness or as to geographical range.

##### *Arthropteris neocaledonica* Copel.

*Arthropteris neocaledonica* Copel. Sargentia 1, 4, 1942.

This has been distinguished from *A. tenella* (Forst. f.) J. Sm. by the possession of black instead of brown scales, and in having the position of the sorus well marked on the upper surface. An examination of collections at Kew shows the last character to be of doubtful value, but the distinctive colour of the scales is in fact consistent for all New Caledonian material. This contrasts very clearly with the light chestnut-brown scales of New Zealand and Norfolk Island specimens. Many of the collections from New Caledonia had previously been identified as *A. tenella*, and the geographical range of that species given in Christensen's "Index Filicum" includes that island, but the characteristic scale colouring was observed on all specimens from there. It seems best then to distinguish two species, geographically separated, *Arthropteris tenella* in New Zealand and Norfolk Island, and *A. neocaledonica* confined to New Caledonia.

##### *Microlepia speluncae* (L.) Moore var. *exserta* Mett.

*Davallia speluncae* var. *exserta* Hk. and Bak. Syn. Fil. 470, 1864.

*Microlepia exserta* Mett. Kuhn Linn. 36, 148, 1869; C. Chr. Ind. Fil. 426, 1906.

An examination of material of *M. speluncae* from the Pacific islands shows the distinguish-



ing character of this variety, the extruded receptacle, to be present only in some material from Fiji, and in that area the degree of extrusion varies considerably. Other Fijian specimens do not have the receptacle extruded at all. In view of the range noted in this character, and the fact that it is not consistent, it is better to regard this as no more than a variety restricted to Fiji.

*Oleandra neriiformis* Cav.

*Oleandra ciliata* Kl. Kuhn Linn. 36, 126, 1869; C. Chr. Ind. Fil. 466, 1906.

Christensen has already reduced many of the Pacific forms of *Oleandra* to synonyms of the widespread *O. neriiformis*, and an examination of a cotype of this species at the British Museum of Natural History shows that it does not go outside the range of characters now accepted for that species.

*Adiantum novae-caledoniae* Keys.

Specimens of *Adiantum* from New Caledonia seem to have been variously identified as *A. novae-caledoniae* Keys., *A. aneitense* Carr., and *A. fulvum* Raoul, without any clear idea as to the distinguishing characters, if any, of these three species. A detailed examination of material from Aneitum, New Caledonia, Norfolk Island, and New Zealand shows that they are not only easily distinguished morphologically, but are geographically isolated. All material from New Caledonia lacks rugose hairs on the upper surface of the pinnae, and the pinnules are usually markedly attenuated. These represent *A. novae-caledoniae*. Specimens from Aneitum also are glabrous on the upper surface and are subglaucous beneath, a character which is still very

apparent in dried examples and which is not found in material from other areas. They also lack the definite lobing on the lower edge of the pinnules which is found in New Caledonian specimens. These form *A. aneitense*. *A. fulvum* as represented by material from New Zealand and Norfolk Island has rugose hairs on the upper surface of the pinnae, a character not noted in any material from New Caledonia ascribed to this species. A summary of this discussion is given here.

- Rugose hairs on upper surface of pinnae.....*A. fulvum* (New Zealand and Norfolk Island).
- Rugose hairs absent on upper surface:
  - Pinnae subglaucous beneath.....*A. aneitense* (Aneitum).
  - Pinnae not subglaucous beneath.....*A. novae-caledoniae* (New Caledonia).

SUMMARY

The small serrated-frond species of the genus *Hymenophyllum* are revised for the South Pacific islands region, and the morphological characters and distributions are clarified for one species of *Arthropteris* and three of *Adiantum*, while one species of *Oleandra* is reduced to synonymy, and a species of *Microlepia* is reduced to varietal rank.

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